

What is claimed is:

1 A remote control device, for control and selection,
5 comprising:

(a) an elongated body for hand held remote control, having
a top side, a bottom side, a front side and an inside;

10 (b) the top side having a multi-function thumb switch, size
of which enabling a human thumb to activate one or other of the
switch functions without physically separating the thumb from
the multi-function switch;

15 (c) the bottom side having an index finger switch, operated
by sliding motion of index finger;

(d) the inside having a electronic means converting the
thumb and index finger switch activations to signals;

20 (e) the front side having transmitting means, transmitting
the signals out of the remote control body.

25 2 The device of claim 1, wherein the multi-function thumb
switch comprising:

(a) a center switch activated by push force;

30 (b) an annular push switch, surrounding the center switch,
having;

(i) four individual quadrant switches arranged in a
circular arrangement with their radial sides in close proximity
to each other, resting on a base plate,

USPTO 08710355 091606
5
(ii) each quadrant switch equipped with electrical contacts and with a spring mechanism resisting thumb pressure, allowing electrical contacts between the quadrant and the base plate to be made, when pressure is applied;

(iii) the electrical contacts, with electrical leads connecting the electrical contacts to the electronic means.

1091606
3 The device of claim 2 wherein the quadrant switch comprising:

15 (a) a movable switch plate, with surrounding walls at near right angles to the switch plate surface, with a contact closing bar all around the surrounding walls;

(b) a fixed base plate, with surrounding walls, at near right angle to the base plate surface, with a plurality of staggered electrical contacts all around the surrounding walls;

20 (c) the movable switch plate placed over the fixed base plate, with the spring mechanism in between them, and the walls of movable plate and fixed plate situated parallel to each other in close proximity, allowing the contact bar to make contact with the one of the electrical contacts at one time;

25 (d) the surrounding walls of fixed base plate flared out, allowing the movable plate via its contact closing bar and the fixed plate to remain engaged in place against the tension of the spring such that the making of the electrical connection
30 between the contact closing bar and one of the plurality of staggered electrical contacts indicative of thumb pressure on the quadrant switch.

35 4. The device of claim 1, wherein the index finger switch comprising:

USPTO 08710355-094596

(a) a slidable switch plate, with a contact closing bar;

(b) a fixed base plate with multiple electrical contacts, whereby the slidable plate is positioned over the fixed plate, allowing it to slide up or down and engagable with one of the multiple electrical contacts with the help of indented means, with electrical leads to the electronic means;

(c) the slidable switch plate having ribbed surface and front and back finger stops enabling the slide switch to be operated by sliding a curved index finger forward or backward from a center position.

5. The device of claim 2, wherein, the electronic means comprising:

(a) a logic converting the switch activations from a quadrant switch to cursor movement commands, whereby the level of contact via degree of thumb pressure on the quadrant switch and time duration of the contact indicative of rate of movement and distance of movement respectively of the cursor;

(b) the logic using the axial direction of the four quadrant switches indicative of direction of cursor movement in X or Y direction in an X-Y plane, whereby if two adjacent quadrant are pushed simultaneously, the cursor moves in a diagonal direction at a rate proportional to thumb pressure and a distance indicative of time duration of thumb pressure.

6. The device of claim 1, further comprising: an electronic display window, placed in the vicinity of the thumb switch on the remote control device, driven by the electronic means to display status information.

7. In display peripherals where mouse like pointing and

USP 7,008,710 3:00 PM 10/16/96

selecting device is used to effect cursor movement and to select an object over which the cursor is positioned, a control device providing an improved means of effecting such cursor movement and object selection, comprising:

(a) a multi-function switch with a center switch activated by push force and an annular switch, surrounding the center switch, also activated by push force whereby the annular switch is used for effecting the cursor movement in X-Y plane and center switch is used for effecting the selection of an object identified by the cursor.

(b) the multi-function switch incorporated in a device controlling the display peripheral.

8. The device as in claim 7, wherein, the annular switch comprising:

(a) four individual quadrant switches arranged in circular arrangement with their radial sides in close proximity to each other, resting on a base plate,

(b) each quadrant switch equipped with a spring mechanism for resisting thumb pressure, allowing electrical contacts between the quadrants and the base plate to be made;

(c) an electronic means converting time duration of switch contacts of quadrants to cursor X-Y movement commands.

9. The device of claim 8 wherein the quadrant switch comprising:

(a) a movable switch plate, with surrounding walls at near right angles to the surface of the plate, with a contact closing bar all around the surrounding walls;

(b) a fixed base plate with surrounding walls, at near right angle to the base plate surface, with a plurality of staggered electrical contacts all around the surrounding walls;

(c) the movable switch plate placed over the fixed base plate, with the spring mechanism in between them, and the walls of movable plate and fixed plate in situated parallel to each other in close proximity, allowing the contact bar to make contact with the one of the electrical contacts at one time;

(d) the surrounding walls of fixed base plate flared out, allowing the movable plate via its contact closing bar and fixed plate to remain engaged against the tension of the spring such that the making of the electrical connection between the contact closing bar and one of the plurality of electrical contacts indicative of thumb pressure on the quadrant switch.

10. For display peripheral based devices, where the peripheral is used to display selection choices for selection, a Display Configuration providing an improved means to display selection choices on the display peripheral and an improved means to make a final selection from an array of such choices; comprising:

(a) a set of choices, and for each choice a set of sub-choices, from which a selection of one or more sub-choice is desired, wherein, each choice and sub-choice represented by a closed figure with borders, space inside the figure identifying the choice or sub-choice, and wherein, numerous sub-choices represented by partially hidden closed figures behind a sub-choice figure;

(b) the choice and sub-choice figures displayed in a three dimensional grid wherein the choice figures are either in a column with the sub-choice figures displayed in rows, or the

choice figures are in a row, with the sub-choice figures displayed in columns;

(c) A cursor used for sub-choice selection, wherein the cursor's position and movement on the display peripheral restricted to being on one of the sub-choice figures, wherein the cursor's position is highlighted by a change in the shading/color of the border of the closed figure identifying the sub-choice, such that when the sub-choice identified as above is selected, a function identified by the sub-choice is invoked.

11. The selection data display format of claim 10, wherein, the closed figure is like a box having four sides.

12. The selection data display format of claim 11, wherein. the four sided figure having within it a smaller closed figures, the space inside of which is used for indicating sub-choice selection history and sequence.

13. The selection data display format of claim 12, further comprising a sub-choice selection highlighted by atleast two sides of the closed figure.

14. The selection data display format of claim 10, further comprising an additional closed figure, content of which identifying previous selections and events.

15. A control mechanism for a device having a display peripheral, a digital general purpose computer, a computer operating system, operating modes to be controlled, a control receiving mechanism, comprising;

(a) a control device having a multi-function switch with a center switch activated by push force and an annular switch,

USPTO 08710388-091596

surrounding the center switch, also activated by push force whereby the annular switch is used for effecting cursor movement in X-Y plane of display peripheral and center switch is used for effecting selection of an object identified by the cursor, and control device outputting switches' activation signals;

(b) on the display peripheral, a set of choices, and for each choice a set of sub-choices, from which a selection of one or more sub-choice is desired;

(c) a programmable logic, receiving the switches' activation signals via the receiving mechanism, selecting from the selection choices on the display peripheral and interfacing with the computer operating system to affect its operating modes.

16. The control mechanism of claim 15, wherein the programmable logic comprising:

(a) a first datafile containing the selection choice data;

(b) a first function means for maintenance of logic state based on sequence of the switch activations and a second function means for maintenance of a cursor's movement based on the annular switch activations;

(c) a second data file containing operating modes of the operating system, wherein each choice data from the first data file has a corresponding operating mode in the second data file, whereby, the programmable logic enabling the display of a selection screen populated with selection choice data from the first data file, enabling selection of a choice from the selection screen, enabling the corresponding operating mode identified in the second data file to be invoked.

USPTO 08710388-091696

17. The control mechanism of claim 16, wherein, first datafile's content and its display format comprising:

(a) a set of choices, and for each choice a set of sub-choices, from which a selection of one or more is desired;

(b) the choice and the sub-choice represented by a four sided figure with borders, space inside the figure identifying the choice;

(c) the sub-choice may be represented by a partially hidden four sided figures behind the four sided figure in the front.

18. The control mechanism of claim 17, wherein, the programming logic receiving remote control commands, controlling the display of selection choice data on the video screen, further comprising:

(a) cursor rate and duration of movement commands from the annular;

(b) a choice selection highlighted by atleast two sides of the four sided figure;

(c) cursor identified selection activated by command from the center switch.

19. A control mechanism for a device having a display peripheral, a TV/Cable tuner, operating modes to be controlled, a control receiving mechanism, comprising;

(a) an elongated body for hand held remote control, having a top side, a bottom side, a front side and an inside;

(b) the top side having a multi-function thumb switch, size

USPTO 08710388-091696

of which enabling a human thumb to activate one or other of the switch functions without physically separating the thumb from the multi-function switch;

(c) the bottom side having an index finger switch, operated by sliding motion of index finger;

(d) the inside having a electronic means converting the thumb and index finger switch activations to signals;

(e) the front side having transmitting means, transmitting the signals out of the remote control body.

(f) on the display peripheral, a set of choices, and for each choice a set of sub- choices, from which a selection of one or more sub-choice is desired;

(g) a programmable logic, receiving the switches' activation signals via the receiving mechanism, selecting from the selection choices on the display peripheral and interfacing with the computer operating system to affect its operating modes.

20. The control mechanism of claim 19, wherein the programmable logic comprising:

(a) a first datafile containing the selection choice data;

(b) a first function means for maintenance of logic state based on sequence of the switch activations and a second function means for maintenance of a cursor's movement based on the annular switch activations;

(c) a second data file containing operating modes of the

operating system, wherein each choice data from the first data file has a corresponding operating mode in the second data file, whereby, the programmable logic enabling the display of a selection screen populated with selection choice data from the first data file, enabling selection of a choice from the selection screen, enabling the corresponding operating mode identified in the second data file to be invoked.

21. The control mechanism of claim 20, wherein, first datafile's content and its display format comprising:

(a) a set of choices, and for each choice a set of sub-choices, from which a selection of one or more is desired;

(b) the choice and the sub-choice represented by a four sided figure with borders, space inside the figure identifying the choice;

(c) the sub-choice may be represented by a partially hidden four sided figures behind the four sided figure in the front.

22. The control mechanism of claim 21, wherein, the programming logic receiving remote control commands, controlling the display of selection choice data on the video screen, further comprising:

(a) cursor rate and duration of movement commands from the annular;

(b) a choice selection highlighted by atleast two sides of the four sided figure;

(c) cursor identified selection activated by command from the center switch.

Add B57
Add D67